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WORK INSTRUCTION PROGRAMS FOR THE FOOD SERVICE INDUSTRY.

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A PROJECT WAS INITIATED TO DEVELOP EFFICIENT WORK METHODS FOR 100 COMMON TASKS IN THE FOOD SERVICE INDUSTRY AND THEN TO PREPARE PROGRAMED LEARNING "PACKAGES" FOR EACH OF THESE TASKS FOR TRAINING POTENTIAL EMPLOYEES AND EMPLOYEES WITH LOWER LEVELS OF EDUCATION TO HOLD USEFUL JOBS. THE CONCEPT OF PROGRAMED LEARNING PACKAGES FOR FOOD SERVICING WAS DEMONSTRATED TO BE EFFECTIVE IN PRELIMINARY FIELD TRYOUTS. EACH PACKAGE CONSISTED OF A SET OF SLIDES, COMBINING PHOTOS AND CAPTIONS, THAT DEPICTED A SERIES OF PROGRAMED STEPS ORGANIZED TO TEACH A SINGLE FOOD PREPARATION TASK. AUDIO TAPES WERE INCLUDED IN THE ORIGINAL PLAN BUT WERE DISCARDED WHEN EXPERIMENTS SHOWED THEY CONTRIBUTED LITTLE TO TASK LEARNING. THE TASKS COVERED BY THE PROGRAMED SLIDES WERE DIPPED SALAD ASSEMBLY, CLEANING A MEAT SLICER, MAKING SALAD SANDWICHES, MAKING SLICED MEAT SANDWICHES, MAKING CHANGE, BREADING FOODS FOR DEEP-FAT FRYING, FROSTING A CAKE, CUTTING A CAKE, PORTIONING PUDDING, AND CUTTING A PIE. ONLY THESE 10 PROGRAMED LESSONS WERE COMPLETED WHEN THE PROJECT WAS CANCELLED BECAUSE OF A LACK OF FUNDS. THE COMPLETED PROGRAMED LESSONS WERE MADE AVAILABLE FOR PURCHASE THROUGH THE DEPARTMENT OF INSTITUTIONAL MANAGEMENT, KANSAS STATE UNIVERSITY. (JH)

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FORWARD

This study was conducted as a partial fulfillment of a contract between the U.S. Office of Education and Kansas State University. The contract was terminated by the Office of Education only ten months after the start of the program: consequently, the information in this report is final but far from conclusive.

Training problems in the food service industry are severe. The project, as proposed, was to have taken thirty-six months to (a) develop efficient work methods for one hundred typical tasks in the food service industry, and (b) develop programmed learning "packages" for communicating the efficient methods for these one hundred tasks to employees.

Users of the program were visualized as area vocational-technical schools and individual food services in hospitals, school lunch, and universities as well as those in private enterprise.

The start of the program was delayed to April 1, 1966 and notification of the cancellation was given November 9, 1966, so the results cover only a ten month period.

Chapter I. Introduction

PROBLEM

The food service industry now has a working force of about three million (1). An acute shortage of skilled employees exists and many expect the shortage to increase as hospitals and food services expand. Donald Greenaway of The National Restaurant Association (17) estimates the food service industry will create 75,000 new jobs per year and will require 150,000 replacements annually.

Conventional on-the-job training has at least four drawbacks. First, the supervisor may not know good work methods, which is no reflection on the supervisor since he cannot be an expert in everything. Second, the supervisor may not be a good teacher. Third, the time for repetitive teaching is rarely available. In addition to a scarcity of capable supervisors, more demanding duties may prevent the supervisor from teaching employees even when the training need is recognized. Fourth, the training need is usually for one or two employees at a specific location rather than large class sizes on a standard schedule. The result is that fellow employees, with neither methods training or teaching experience, do the instructing. Needed is an expert teacher who knows a good work method and is available whenever the employee needs help.

Programmed learning fulfills these needs. Experiments and pilot programs at Kansas State University, as well as the research of others, indicate that programmed learning is effective. Of interest is the finding that these techniques are especially valuable for those with lower educational levels.

School lunch programs, hospital dietary departments, university residence halls, and commercial food services require this help, as well as teachers of quantity food preparation classes in Area Vocational Technical Schools.

No programmed instruction material is available. Material prepared for other media is, in general, proprietary.

OBJECTIVES

1. To develop efficient work methods for 100 typical tasks performed by employees for the cluster of occupations in the food service industry. Development of efficient work methods implies several steps: selection of the task, determination of optimum procedure, and breaking the procedure into proper detailed steps.

2. To develop programmed learning media for communicating these methods to employees. The specific medium recommended is step-by-step colored 35 mm. slides. This pictorial type of program has been experimentally demonstrated to be more effective than spoken or written words. It is especially effective for employees with lower levels of verbal and reading skills.

Related Research or Background Information

Research by Others. Interest in programmed learning has increased since Skinner's article "The Science of Learning and the Art of Teaching" in 1954 but most studies have been academic rather than work training. A decade later, Schramm (30) compiled 160 papers of original research on programmed learning. Only 18 dealt with work related tasks and more than 80% of the 160 experiments used student subjects. In general, the studies dealt with binary number systems, nonsense syllables, Russian words, etc. Programmed learning in the food service industry remains virtually unexplored. In the one reported study, Moore and Carter (27) concluded that material presented on an Auto Tutor teaching machine was potentially an effective tool for teaching sanitation to non-professional food service employees.

In general, it has been established that the visual channel is better than the auditory channel to transmit information (4) (5). Cardozo and Leopold (11) demonstrated that visual input of information caused fewer errors than auditory input. Roshal (29) compared slides and motion pictures for a knot-tying task and found motion pictures better. However, he stated "For simple tasks, the most important consideration may be the accurate representation of the product of the perceptual motor skill." Any task becomes "simple" if broken into a step-by-step sequence. Roshal noted when the subject tied the knot at the same time as the film was being shown that this divided attention seemed to conflict. McGuire (25) felt that film portrayals of performance tend to present information faster than receptive capacity. A characteristic of filmed instruction is that it tends to act as a pacing device, while slides can be actuated by the student at his own pace.

Use of the word "visual" is deceiving. Both a typed list of instructions and step-by-step colored pictures of the task are visual. Cross, Noble, and Trumbo (14) in a study on controls found that it was more effective to present a picture of what the operation should duplicate (i.e. matching behavior) than to give the operator directions on how to move (i.e. move control left 5" and then down 3").

The auditory channel has its partisans also. Goldman and Eisenberg (16) found that auditory input of information on an assembly task was faster than posting a list of instructions in front of the worker. Erlick and Hunt (15) cite an advantage of using the auditory channel. Information can be presented by equipment located in less critical work areas, while visual information generally requires either shifting the operator's head orientation or locating the equipment immediately in front of the operator in an often already crowded work space. Thus, for tasks in which the operator is working while he is being instructed, this means he reads the information and then performs the task (i.e. works sequentially). Giving the information to the operator through the auditory channel allows him to work "in parallel" as he can obtain information and work at the same time.

Recently, relatively sophisticated (and expensive) equipment (1)(3)(4)(5)(6) has been used in industry which has tape recorded commentaries accompanying colored slides. On at least one unit (18) the voice is automatically hushed at the end of the instruction so the operator can hear background music.

For tasks in which the worker is expected to memorize or learn rather than always have the aid of the equipment, there are many and varied devices and approaches used in American industry. The American Petroleum Institute (24) has programmed learning text on "Practical Distillation", DuPont (8) has

a series including "Reading Engineering Drawings" and "Liquid Level Measurement". Timkin Roller Bearings' series (7) includes "Lubrication", and IBM (13)(20) teaches maintenance of its 7070 data processing systems. English industry also uses programmed instruction. British European Airways (9)(10) uses it for training punch card operators while the Steel Co. of Wales (21) has a program "Introduction to the Spencer Works". Mr. P. Brodie of the Westwood Works of Baker Perkins Limited in a personal communication stated they had 25 programs in the area of "Fitting, Machining and Platework" with individual programs on "Types of Files", "The Hacksaw", "Care and Use of the Micrometer", "Care and Safety of Files", etc.

Research at Kansas State University. Communication through programmed learning can be of two types: 1. Work instruction, in which the operator has a detailed procedure such as a typed list, colored slides, or taped audio instruction. This detailed procedure is always available to the operator, and he is not expected to do the task without using the communication aid. 2. Training, in which the operator is expected to memorize a procedure during a training period. Although he may occasionally refer back to some material, he is expected in normal on-the-job operation to know the proper procedure.

The departments of Industrial Engineering and Institutional Management have done research in both types of work communication. The results are very briefly summarized in Table 1. (23) Experiments one, two, three, four, and six are described in detail in Konz et al. (22). They statistically demonstrated that pictorial techniques permitted an average reduction of time per assembly to 50 percent of that required using a typed list and errors to 15 percent of that when using a typed list. The improvement was

Table 1. Summary of results of experiments performed at KSU.

Experiment	Task	No. assembled per media	Subjects	Media	Average errors/ unit	Average time(min.)/ unit
1.	Pegboard	1668	20	Typed list	.38	.81
				Three pictures/unit	.06	.38
2.	Pegboard	100	20	Typed list on slide	.32	.88
				One picture/unit	.12	.47
3.	Pegboard	720	16	Typed list	.29	1.08
				Three pictures/unit	.13	.47
				One picture/unit	.07	.50
				Audio	.59	1.01
4.	Pegboard	480	10	Typed list	.22	.72
				One picture/unit	.07	.41
5.	Salad Assembly	28	14	Typed words		13.9
				Typed words+pictures		12.2
6.	Elect. wiring	180	12	Typed list	.42	2.09
				Picture	.27	1.95
				Audio	.80	1.66
7.	Salad Assembly	28	14	Typed words		10.0
				Typed words+pictures		9.3
8.	Salad Assembly	28	14	Typed words		12.5
				Typed words+pictures		11.2
9.	Pegboard	500	8	Audio	.27	.73
				Audio+typed list	.28	.59
10.	Pegboard	1800	10	One picture/unit	.03	.35
				One picture/unit+ audio	.08	.39
11.	Salad Assembly	64	32	Typed words	2.2	10.4
				Typed words+audio	2.3	10.6
				Pictures+words	1.6	11.0
				Pictures+words+ audio	1.5	9.6
12.	Salad Assembly	64	32	Typed words	2.8	11.0
				Typed words+audio	1.2	12.8
				Pictures+words	1.0	9.0
				Pictures+words+ audio	1.1	11.1
13.	Elect. wiring	180	12	Audio	2.04	1.69
				Audio+rotary table	1.08	1.35
				Lights on picture+ rotary table	.41	.90

negatively correlated with educational level. That is, those with lower educational levels benefitted more from pictorial instruction than those with more schooling. Experiments nine and ten reveal that when audio is added to another media the result is not necessarily an improvement in performance. In fact, for the assembly situation studied, performance declined when the audio was added. Experiment thirteen investigated the media when used in conjunction with an automatic assembly table. Again the performance with audio instructions was disappointing.

The departments also have been active in the area of food service training. In the fall of 1964 Naline Apley of the Department of Institutional Management (2) prepared two audio-visual programs for waitresses: Setting a Banquet Place Cover, and 2, Service of the Banquet Dinner Plate, Rolls, and Coffee. Each program consisted of a series of colored 35 mm. slides accompanied by a recorded commentary on tape. The slides were manually advanced by the listener when he heard the words "change slide" from the recorded commentary. The first program explained in detail how the waitress should place the silverware, napkin, plate, glass, and coffee cup on the table. The second program explained to the waitress how the dinner plate, rolls, and coffee should be served to the customer. These two programs were especially suitable for instructing temporary employees hired for banquet service.

A program for kitchen workers entitled "Two Techniques for Breading Foods" was prepared in the spring of 1965. A series of 35 mm. colored slides, with an accompanying tape recorded message, was designed to be used with a Hughes 202 Videosonic. A 60 cycle pulse was placed on the tape at the proper locations and the Videosonic automatically changed the slides. The program is discussed in more detail in the article by Konz and Middleton (26).

Although the Videosonic worked satisfactorily, the requirement of synchronized voice and picture forces a user to purchase relatively expensive equipment (approx. $600). Maintenance and operation skills, which may not be available in a typical institutional kitchen, would be required. Therefore, a new program for kitchen employees, "Dipped Salad Assembly", which described an efficient procedure to prepare 100 dipped salads, was prepared. Two types of programs were developed: 1. Typed step-by-step instructions were photographed and presented one instruction at a time on slides. 2. The same typed instructions of program 1 were superimposed over the bottom portion of a picture showing what the words described. No tape recording was used. These two programs have been experimentally evaluated with five different groups: 1. experiment five used fourteen seniors in home economics (i.e. subjects relatively familiar with quantity food preparation techniques); 2. experiment seven used fourteen freshmen in home economics (i.e. subjects with relatively high intelligence but no experience in quantity food preparation techniques); 3. experiment eight used fourteen kitchen employees of the Kansas State Student Union (i.e. subjects typical of those in most institutional kitchens); 4. experiment eleven used 32 freshmen women; 5. experiment twelve used a different group of 32 freshmen women.

The first three groups required about 10 percent more time when receiving information from the printed instructions alone than when they had printed instructions superimposed on the picture. The quality seemed poorer for the non-pictorial instruction although no record was kept of quality. For the last two experiments quality was estimated as well as time. The data was compatible with the other experiments in that it again indicated that there was a positive benefit from the use of pictures and that the use of audio in addition to other media was of questionable merit.

The above experiments, supported by the few other studies available, led to the decision to use pictorial instruction. A basic system of only pictures eliminates considerable equipment cost since relatively automatic slide projectors are available for $100. If audio is added, a combination of a projector and a tape recorder costs approximately $250. If Kansas State added prerecorded non-audible pulses to the tape, the user, by purchasing an additional piece of equipment for $30, can have the tape automatically advance the slides. More versatile and compact pieces of equipment with the projector, tape recorder and programmer in one package are available for $500 and up.

Another alternative is between slides and film strips. The projection equipment costs are approximately equal with a possible small advantage for slides. Slide projectors are more commonly available and there are more service and repair facilities available. Film strips may offer a small advantage to the customer (probably less than $1 per program) in program cost. Slides, however, are less likely to be damaged since they would normally be mounted in metal frames and left in a magazine so that the operator would not even touch the slide. Film strips are handled by the operator and film strip equipment, in general, is not very automatic.

With all the above in mind it was decided to recommend slides as the medium. People being what they are, it was realized that this would not satisfy all parties. Therefore audio tapes were to be available for each program for an additional charge. The programs also were to be available in filmstrips for those who desire them that way.

Once the project was underway and more direct experience with the specific problems of the industry was obtained, it was concluded that even a slide projector is too complicated, expensive and unavailable to most food services. The presentation technique now recommended is color photographic

prints in a booklet form. For group instruction and more sophisticated training programs, color slides will work well. Sumbingco (31) demonstrated that food service employees can learn the cutting a pie program and the cleaning a meat slicer program in a classroom environment and then can go immediately into a kitchen environment and do excellent work without further supervision.

III RESULTS

Needs of the industry. In the original draft of the proposal, the needs of the industry were to be determined by contact by the principal investigators with knowledgeable people in the industry. At the request of the Project Officer of the Office of Education, this was changed to a mail questionnaire. (See Appendix A).

The questionnaire on the needs of the industry was sent to 800 people with a letter of transmittal, an example program (Dipped Salad Assembly) including slides, quiz & script, and an addressed stamped return envelope.

Five hundred were sent to members of the National Restaurant Association in a sample stratified by states and by rural-urban location within that state. In addition the questionnaire was sent to 50 school lunch programs, 50 hospitals who had a member in the American Dietetic Association and 50 college & university residence halls.

The names and addresses of 150 vocational technical schools with food service programs were obtained by writing the State Director of Vocational Education of each state. Their questionnaire was accompanied with the letter of transmittal (Appendix B), two example programs (Dipped Salad Assembly and Cutting a Pie) (Appendix C and D) and the addressed stamped return envelope.

Results are tabulated in Table 2. Sixty five percent of this select sample did not even return the slide programs even though they had a stamped addressed return envelope in their hands; another 15% returned the programs with an unanswered questionnaire. Of the 20% who did answer, most did not answer the complete questionnaire; most just answered what types of programs they wanted. Giving 1 for 1st choice, 2 for second, etc. the desires of the 68 who ranked the items are given in Table 3. Informal comments are given in Appendix E.

Table 2. Results of Questionnaire

RESPONDENT CATEGORY	Sent	Replies			
		LETTERS	ANSWERED QUEST.	UNANSWERED QUEST.	TOTAL
COMMERCIAL	500				
Cafeterias			4	1	5
Catering		4	3	3	10
Drive-ins				5	5
Hotels		1	2	1	4
Restaurants		5	18	14	37
		(10)	(27)	(24)	(61)
COLLEGE & UNIV. RESIDENT HALLS	50	9	29	1	39
HOSPITALS	50				6
SCHOOL LUNCH	50	2	32	3	37
VO-TECH	150	6	17	5	28
	800	27	109	35	171
Blank Replies				110	110
TOTALS	800	27	109	145	281

Table 3. Program Preferences from Questionnaire

1. Use of French knife (3.09)	6. Cutting & Serving Pie (4.19)
2. Counter Arrangement (3.19)	7. Racking Dishes for Machine (4.2)
3. Making Salads (3.37)	8. Clearning Meat Slicer (4.4)
4. Shaping & Panning Rolls (3.72)	9. Breading Foods (4.59)
5. Making Change (4.17)	10. Frosting Cake (6.16)

In addition, there were 14 suggestions on "Sanitation", 9 for "Cooking Use & Maintenance", 8 for "Cooking Principles", 8 for "Making Sandwiches", 7 for "Dishwashing" and 4 for "Table Setting".

The questionnaire seems to have been a waste of time and effort although it did point out the lack of effectiveness of direct mail as a method of obtaining information from the industry.

Programming media The original concept of the project had been short, highly specific self-instruction programs that were very pictorial. The programs were to be color 35 mm slides. No audio was to be utilized since tape playing devices add cost and complexity to the communication equipment and, most important, had not been demonstrated, in our experiments, to decrease work time or errors of the operators when compared versus the same program presented pictorially with no audio.

It was discovered as the programs were developed that they could effectively communicate the "how" of a task; the "why", however, was not easy to demonstrate pictorially. Because of this, a script was developed which would be read either by the trainee or the teacher.

An index of the knowledge obtained by the trainee was also desirable so a quiz was developed for each program.

It was also desirable to have a copy of the program available for each employee to keep. Slide duplication costs and the requirement for a means of projection eliminated the possibility of giving the employee a box of slides;

the high cost of color print reproduction argues against a color print; and the relatively low number of copies of each program suggests color printing's original cost for the setup would make the cost per copy too high. The decision was to make a black and white printed copy which required a setup cost of about $40 per program; cost per page, once set up, are about 1/4 cent. This black and white setup has been done only for the Cutting a Pie program. (Appendix F)

The recommended communication package for a group are slides, script, quiz and black & white handout. The teacher would show the color slides while commenting from the script about "why" and giving variations pertinent to the specific organization; the student would then take the written quiz; if necessary would review the slides and then would be given a black and white copy of the program for his personal use.

Many institutions find that a slide projector is not available or is too complicated to use or do not have space to operate one. For them, we recommend that a booklet of color photographs replace the slides. Sumbingco (31) has demonstrated the effectiveness of this approach.

Programs Since it was expected that at least 100 programs were to be prepared over a three year period, at the beginning it seemed desirable to make programs in a wide variety of topics rather than concentrate initially on any one specific area. Because the cancellation notice was received just seven months after the start of the project, the gaps in the program topics have not been filled. The programs that have been completed are:

Dipped Salad Assembly	Breading Foods for Deep Fat Frying
Cleaning a Meat Slicer	Frosting a Cake
Making Salad Sandwiches	Cutting a Cake
Making Sliced Meat Sandwiches	Portioning Pudding
Making Change	Cutting a Pie

Fifty five copies of the ten programs (slides, script and quiz) were sent to the program officer at the Office of Education. Each of the above programs

went through the following:

1. Concept of program was developed and efficient work methods determined.

2. First rough draft with photographs was reviewed by others in group. Changes in wording of signs, deletion and addition of steps, and modification of camera angle were common changes. A particular attempt was made to use simple Anglo-Saxon words since it was anticipated the program users would have relatively low reading and verbal skills; in addition, the picture carried the message since the words were considered as supplements.

3. Additional drafts were prepared until the designer was satisfied. Subjects then were obtained (mostly college students). They viewed the slides and then tried to do the task. From their hesitations, mistakes, and comments, the designer could see where the program needed improvement.

4. When a draft program could be done the first time by a college student without a mistake, it was considered ready for field testing on non-college employees of food service institutions.

5. After comments and suggestions from the field had been incorporated, the final shots were made by a professional photographer and the program was considered complete.

Because the program was considered complete does not mean that it is perfect. Each program gives a good efficient work method; there may be better ones that we did not know of. Each program communicates this method effectively; it is quite likely that improved communication techniques will be developed.

Each of the above programs is available at cost ($7 apiece) from Dept. of Institutional Management, Kansas State University, Manhattan, Kansas, 66502.

In addition to the completed programs listed above, seven more programs were brought to stage three or four before the project was terminated. They are:

Weighing Ingredients
Panning Rolls
Preparation for Operation of a Dishwasher
Serving Dinner, Rolls and Coffee
Setting a Table
Setting a Banquet Table
Clearing a Table

VI CONCLUSIONS

The investigators feel that there still remains a great training need in the food service industry--especially for those employees with the low levels of verbal and reading skills who are hired into such jobs as dishwasher, bus boy, kitchen helper, salad girl, etc.

If additional work is done, the needs of the industry should not be investigated by direct mail but through personal conferences with knowledgeable people in the area. Now that a wide variety of program titles have been completed, an intensive covering of a specific area such as "Sanitation" seems a logical step. This could be approached in programs in "Personal Sanitation", then a series in "Sanitary Handling of Food" "Sanitary Preparation of Food" "Sanitary Serving of Food" and then another series on "Sanitary Cleanup and Washing Procedures". There is great flexibility in the communication technique we have developed; the application areas are widespread.

Even though the project has been formally terminated, several graduate students in Institutional Management are continuing research on methods of communicating information to food service workers. In addition, the programs already completed are available to anyone who wishes them for the cost of duplication ($7 per program).

SUMMARY

Training problems in the food service industry are severe--especially for those with low levels of verbal and reading skills.

A project was started to develop efficient work methods for 100 common tasks in the food service industry and then to prepare programmed learning "packages" for each of these tasks so that underpriviledged employees and potential employees could be trained to hold useful jobs.

The concept was demonstrated to be good--the unskilled can be trained to do usefull work. Unfortunately the program was cancelled because of lack of Office of Education funds after only ten programs were completed. They are:

Dipped Salad Assembly	Breading Foods for Deep Fat Frying
Cleaning a Meat Slicer	Frosting a Cake
Making Salad Sandwiches	Cutting a Cake
Making Sliced Meat Sandwiches	Portioning Pudding
Making Change	Cutting a Pie

Each program is available for $7 from Department of Institutional Management, Kansas State University, Manhattan, Kansas. 66502

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APPENDIX A

DEPARTMENTS OF INSTITUTIONAL MANAGEMENT AND INDUSTRIAL ENGINEERING
KANSAS STATE UNIVERSITY, Manhattan, Kansas 66502

All Answers Will Be Kept Confidential

Organization Name_____ Date_____
Street_____
City and State_____

* * * *

5. Percent of trainees with some previous experience in food service work:

Counter attendant	0	25%	50%	75%	100%
Waitress	0	25%	50%	75%	100%
Bus boy or bus girl	0	25%	50%	75%	100%
Host or hostess	0	25%	50%	75%	100%
Vegetable cook	0	25%	50%	75%	100%
Cashier	0	25%	50%	75%	100%
Meat cook	0	25%	50%	75%	100%
Short order cook	0	25%	50%	75%	100%
Fry cook	0	25%	50%	75%	100%
Pantryman or pantrywoman	0	25%	50%	75%	100%
Salad	0	25%	50%	75%	100%
Bakery	0	25%	50%	75%	100%
Pre-prep	0	25%	50%	75%	100%
Dishwasher	0	25%	50%	75%	100%
Kitchen helper	0	25%	50%	75%	100%
Other_____ (Please specify)	0	25%	50%	75%	100%
Other_____ (Please specify)	0	25%	50%	75%	100%

* * * *

5. Which of the following training aids are presently used by your organization to supplement your direct training:

Visual Aids		Printed literature	
Movies	_____hours/week	Your literature	_____hours/week
Slides	_____hours/week	Books	_____hours/week
Filmstrips	_____hours/week	Manufacturer's literature	_____hours/week
		Trade journals	_____hours/week
Manufacturer's representatives	____hours/week		

6. Number the programs, including those which you have added, with a 1 for most desirable, 2 for second choice, etc.:

Cleaning Meat Slicer	_____	Breading Foods for Deep Fat Frying	_____
Making Change	_____	How to Assemble 100 Salads	_____
Cutting and Serving a Pie	_____	Attractive Counter Arrangement	_____
Frosting a Cake	_____	Use of the French Knife	_____
Shaping and Panning Rolls	_____	Racking Dishes for a Dish Machine	_____

Additional titles:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

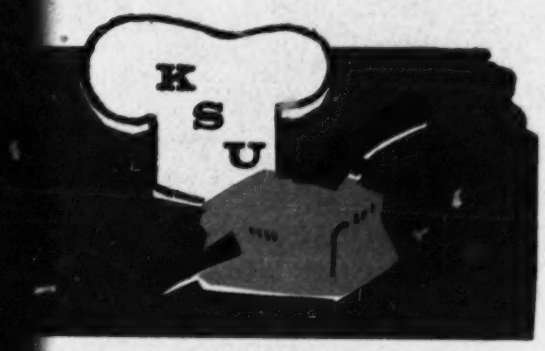
THANK YOU!

Stephan Konz

Stephan Konz

Raymona Middleton

Raymona Middleton



FOOD SERVICE INDUSTRY WORK INSTRUCTION PROGRAM

Institutional Management--Industrial Engineering
Kansas State University
Manhattan, Kansas 66502
Area 913 - JE 9-2211 Ext. 580

Dear Sirs:

At Kansas State University, a project has been initiated to:

1. Develop efficient work methods for common tasks in the food service industry.
2. Make available an effective and time-saving means of communicating these methods to employees.

These efficient work methods will be depicted on 35 mm color slides. Enclosed are two experimental programs, "Dipped Salads" and "Slicing and Portioning a Pie". These step-by-step color slides can be used in any slide projector and are designed for self-instruction. Programs will be available for $5.00 to $9.00 per program, depending on actual costs involved. They also can be rented for 30 days for $4.00 a program. Fifteen programs will be available by October 1, 1966 and 100 by April 1, 1969.

Enclosed is a questionnaire which was sent to a sample of commercial, school lunch, hospital, college and university food services. They were representative of the industry according to geographical area. Since the first questions are not applicable to you, you need only to answer question six on the last page of the questionnaire. Your responses in combination with those who complete the entire questionnaire will be used to determine the tasks to be programmed.

If you wish to keep the slides, enclose a check for $14.00 or write "please bill me" on the first page of the questionnaire. If you do not wish to keep the slides, place them in the enclosed, self-addressed stamped envelope with the questionnaire.

Thank you,

Mrs. Raymona Middleton

Mrs. Raymona Middleton
Assistant Professor
Institutional Management

Dr. Stephan Konz

Dr. Stephan Konz
Associate Professor
Industrial Engineering

APPENDIX C

SCRIPT - CUTTING A TWO CRUST PIE

1. Title
2. Get an overall view before looking at details.
3. Stack enough plates to fill tray.
4. Holding marker by edges makes it easier to center:
    1. More accurate
    2. Hands don't obscure center of pie.
5. Use edge of pan as a guide to position marker in center of pie.
6. Press marker lightly on crust. Only guide marks are needed.
7. Only point of marker penetrates top crust. Each portion is equal.
8. Mark all pies to be cut. This avoids extra effort of picking up and laying down the marker.
9. For maximum control of knife, grasp with index finger pointing along top of blade.
10. For least work, cut all pies you need at same time.
11. Put server under portion. Palm knife in left hand.
12. Center portion on plate.
13. Use knife to keep pie in position on plate while removing server.
14. Continue to remove pieces.
15. All pieces face same direction. This enables next employee to serve with less effort.
16. Remaining filling in the bottom of pie pan should not be thrown away. Put on pies.

QUIZ - CUTTING A TWO CRUST PIE

1. What utensils are needed to cut a two crust pie?

2. Is the pie marker held at the center or the edges? Why?

3. Is the pie marker pushed down to the bottom crust?

4. Why is the pie marker used?

5. Why mark all pies at once?

6. Should the index finger point along the top of the knife?

7. Should all pies be cut at the same time? Why?

8. How is the knife used in placing the pie on the individual plates?

QUIZ - CUTTING A TWO CRUST PIE

1. What utensils are needed to cut a two crust pie?
   1. Pie marker
   2. Table knife
   3. Pie server

2. Is the pie marker held at the center or the edges? Why?
   Edges: 1. More accurate 2. Hands don't obscure center of pie.

3. Is the pie marker pushed down to the bottom crust?
   No. Just through top crust.

4. Why is the pie marker used?
   So all portions are equal.

5. Why mark all pies at once?
   You pick up and put down the marker only once.

6. Should the index finger point along the top of the knife?
   Yes.

7. Should all pies be cut at the same time? Why?
   Yes. Less handling of the knife.

8. How is the knife used in placing the pie on the individual plates?
   Knife holds pie in position on plate while you slide server from under the piece.

9. Why do all pieces face the same direction?
   So next employee has less work.

10. Why give the customer the remaining filling in the pan?
    To avoid waste and give the customer the most for his money.

APPENDIX D

SCRIPT - COTTAGE CHEESE SALAD

Slide Reference

1. Getting a general idea of the method first is important to the learning process.

2. The head lettuce has been washed, cored, and leaves separated. A #12 dipper makes a good looking salad when cherry tomatoes are used as a garnish.
The relationship of the bowls is important to the method.
Make set-up as shown.

3.

4. The plates may be put on the tray before hand.

5.
6.
7.

8. The plates may overlap each other and the tray edge.

9. Lettuce should be picked up with rounded part down.

10.
11.

12. Note that all of the lettuce is cupped up so that the salad is contained by the lettuce.

13. Three tomatoes seem to work well here, but other numbers may be used depending upon the garnish.

14. A round bowl is used since it is easier to scoop out the last of the cottage cheese when empty.

15. A level dipper insures an equal portioning of cottage cheese.

16. By starting in the upper left corner, you prevent 1) damage to other salads as you go or 2) dripping on a completed salad.

17.

18. Squeezing the dipper in the middle of the plate gives a round and even portion. Also, all cheese in dipper is removed.

19. Tomatoes should all be at left so that the counter girl or waitress can easily arrange each plate in the same fashion on the counter or table.

20. By working down, you again avoid damage to finished salads.

21.
22.
23.
24.
25.
26.
27.

28. Again, work left to right to avoid damage to finished salads.

29. A finished tray should have an even portioning of cottage cheese with all the tomatoes in the same relative location.

30.

QUIZ - COTTAGE CHEESE SALAD

1. What are all the things needed to make cottage cheese salads using the method shown?

2. Do the plates over lap each other on the tray edge (as shown)?

3. Why is a round cottage cheese container used?

4. Should the lettuce be cupped-up or cupped-down when placed on the plates? Why?

5. Does it matter if you pick up more or less than three tomatoes at a time? Would it depend on the garnish (size, shape)?

6. Why should all the tomatoes be on the left?

7. Why level the dipper?

8. Is squeezing the dipper necessary? Why?

9. Why make salads from the top to bottom, left to right?

QUIZ - COTTAGE CHEESE SALAD

1. What are all the things needed to make cottage cheese salads using the method shown?

   Plates, dipper, tray, cottage cheese, tomatoes, lettuce.

2. Do the plates over lap each other on the tray edge (as shown)?

   Yes, this is often the case. This way, the plates are locked on the tray and do not slide when the tray is moved.

3. Why is a round cottage cheese container used?

   A round container is more convenient for scooping out the last portions of cottage cheese when the bowl is being emptied.

4. Should the lettuce be cupped-up or cupped-down when placed on the plates? Why?

   Cupped-up; the cottage cheese and tomato are then contained and will not slide or move around.

5. Does it matter if you pick up more or less than three tomatoes at a time? Would it depend on the garnish (size, shape)?

   The number of tomatoes picked up would depend on how many you could easily handle. If paprika is the garnish, enough for many salads would be held in in a shaker.

6. Why should all the tomatoes be on the left?

   So that the counter girl or waitress can easily orient each salad.

7. Why level the dipper?

   To make the portions equal.

8. Is squeezing the dipper necessary? Why?

   Yes; all of the contents are then removed in an attractive ball shape.

9. Why make salads from the top to bottom, left to right?

   To avoid damage or dripping on completed salads.

APPENDIX E

COMMENTS RECEIVED FROM FOOD SERVICE ORGANIZATIONS PERTAINING TO THE H.E.W. PROJECT

Good

1. The quizes are a good review.

2. I was able to identify principles of management.

3. The desirability of this would be determined by the needs of the group. Some programs are needed by all employees while others, if specialized, are not needed by all for daily use and application.

4. I would suggest that this information be sent to the Vice-President of Forum Cafeterias of America- 1021 Grand Ave., Kansas City, Missouri.

5. It was very interesting. I am glad to have something like this available to the Food Service Industry. I am sure that we are all going to benefit from it in the future. (Wayne State University, Malone).

6. Need a set for a waitress training program.

7. Very helpful.

8. Good training. I feel sure that it will be available for students who finish high school.

9. I think that this program is one of the best things that has happened to the restaurant industry. Finally, the restaurant operator can get professional help that he so desperately needs. I would hope that this program could be carried a step further for the drive-in operators.

10. I hope that you have success in these programs as they are desperately needed.

11. I think that the technique you are using is an excellent one.

12. We have tried your program and enjoyed it very much.

13. I will be interested in your programs for a short course program that I will be teaching in 1967.

14. I am very interested.

15. I have viewed the programs and consider them quite good for instructional purposes. I feel that a program of this type consisting of a step-by-step instructions illustrated in this slide together with the script and quiz sheet would be of great value.

16. Programs sound very good.

17. As you may know local and state public health depts. are interested in this kind of material for their food handlers short courses.

18. Benefited from this experience. Slides are excellent, they are detailed and uncomplicated so that my senior girls found them most helpful. This is the only material that we have found that presents this type of material for learning. More such training aids are needed.

19. I enjoyed your programs very much. Would like additional programs. I think the technique that you are using is an excellent one. I would like very much to have the opportunity to review future films as you produce them, regardless of the subject.

UNFAVORABLE COMMENTS

1. Technique is not as good as personal demonstration techniques.

2. Cost is expensive.

3. We have a small turnover. Training generally done by direct training supplemented by trade journals and books.

4. Not practical. We do not train enough at one time to make it practical.

5. Assembly line operations are used to get out our large quantity of foods.

6. Can't use slides.

7. Slides are not appropriate for our particular operation.

8. Do not apply to school lunch program. Two employees only do the preparation.

9. Can't use slides effectively.

10. There is no help available to train. Nothing will help.

11. Do not feel we can utilize this service at this time.

12. Work with slides - very good, but too expensive for us in this training program.

13. As yet, we are teaching Home Economics and no use for this type of material.

14. Do not have use for this material this time.

15. Found the film much too elementary to be used for our course. (Vocational School).

16. If the Cottage Cheese Salad is a sample of what's coming, scrap the whole project.

    It is an insult to 90% of the employees in the food service industry.

    They belong at about 3rd and 4th grade level or for the school of mental retardiness.

    Manufacturers representative will cover most of these programs upon request and have visual aids on request.

    Someone is spending a lot of time and money on a foolish project.

    Make programs that could be shown to supervisory level so that they in turn could teach the employees.

17. Our problems are not necessarily how to "but the personnel aspect".

18. This appears to be too elementary - a level for school lunch personnel.

19. The children do not care much for cottage cheese and serving of pies in their program is very limited.

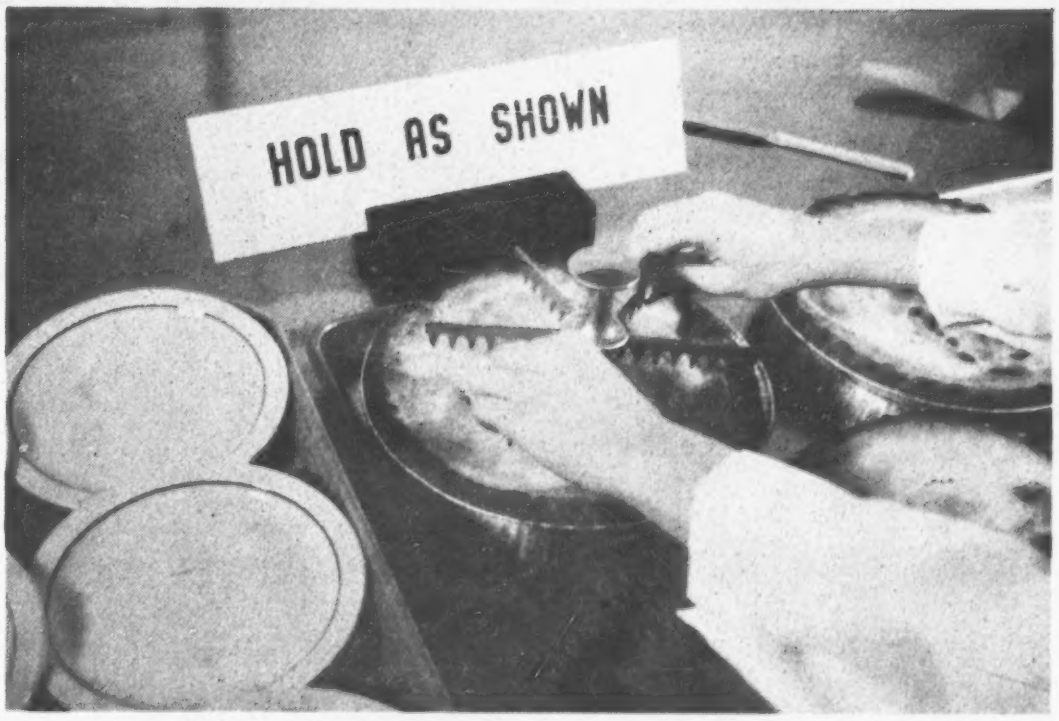
20. At the present time our company is mainly concerned with the training of management personnel.

21. We are returning slides - not the type of salad we use.

APPENDIX F
CUTTING A TWO CRUST PIE

Scan the program quickly, then go back to look at each step in detail.

Stack enough plates to fill tray.

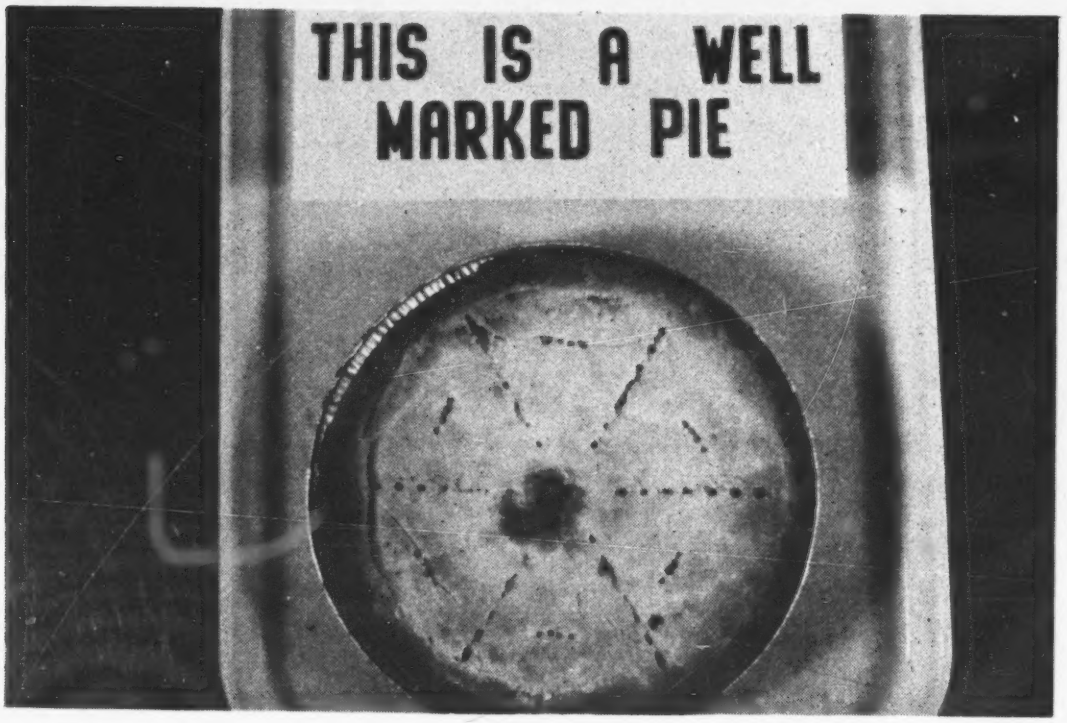


Holding marker by edges makes it easier to center:

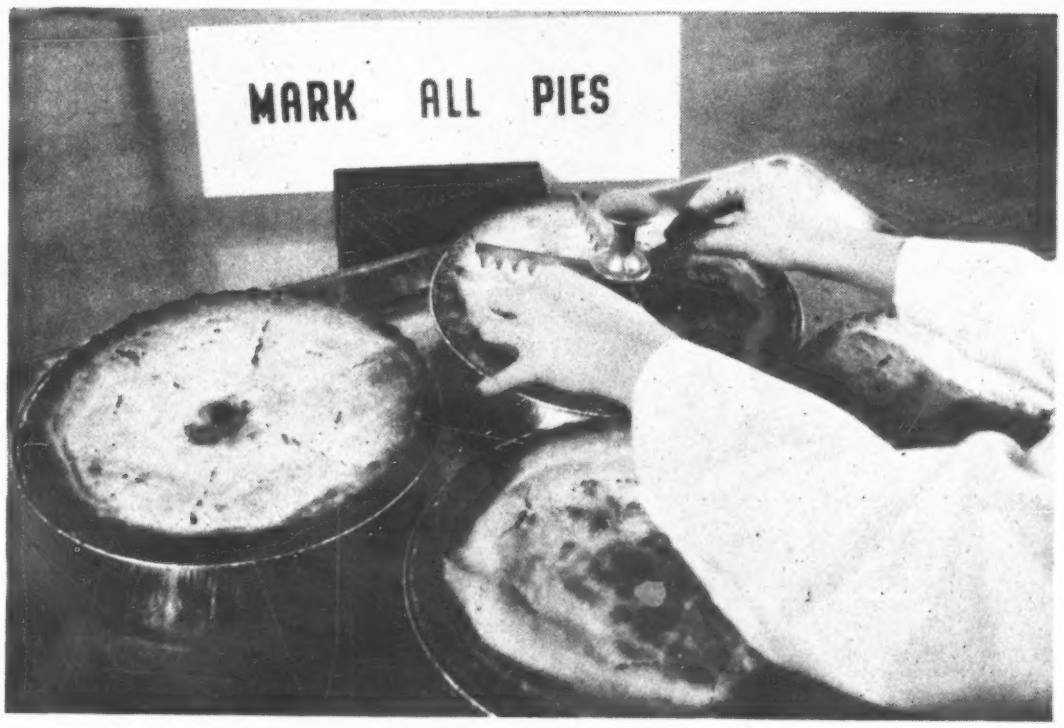
1. More accurate.
2. Hands don't obscure center of pie.

Use edge of pan as a guide to position marker in center of pie.

Press marker lightly on crust. Only guide marks are needed.

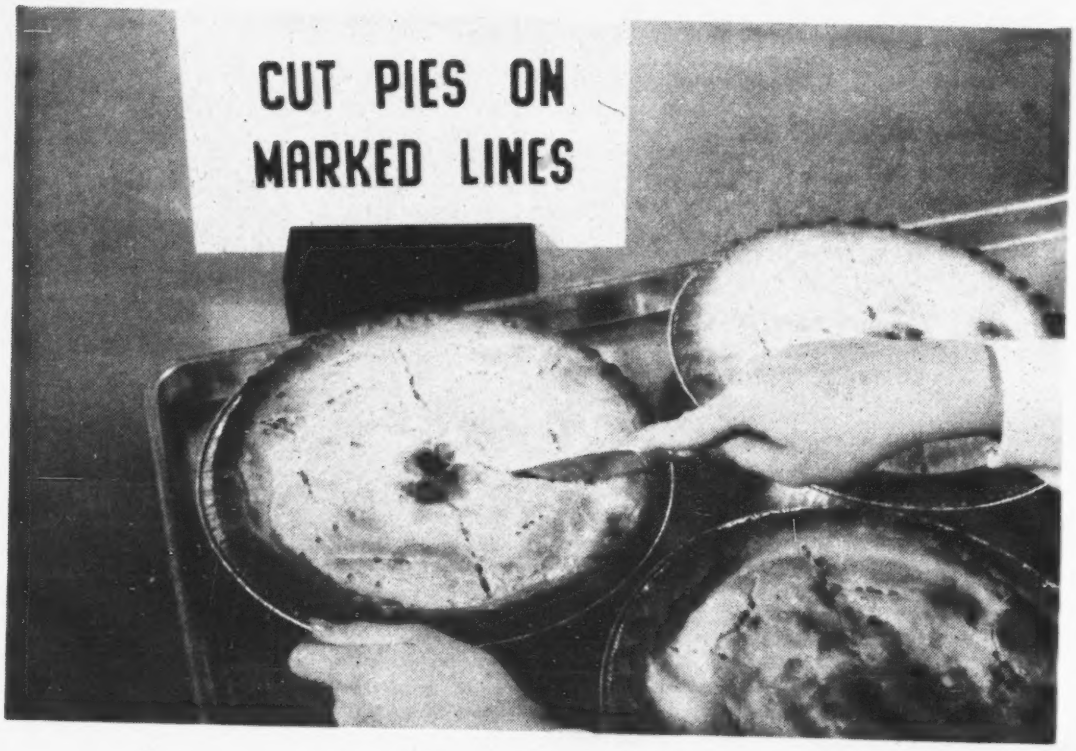


Only point of marker penetrates top crust. Each portion is equal.

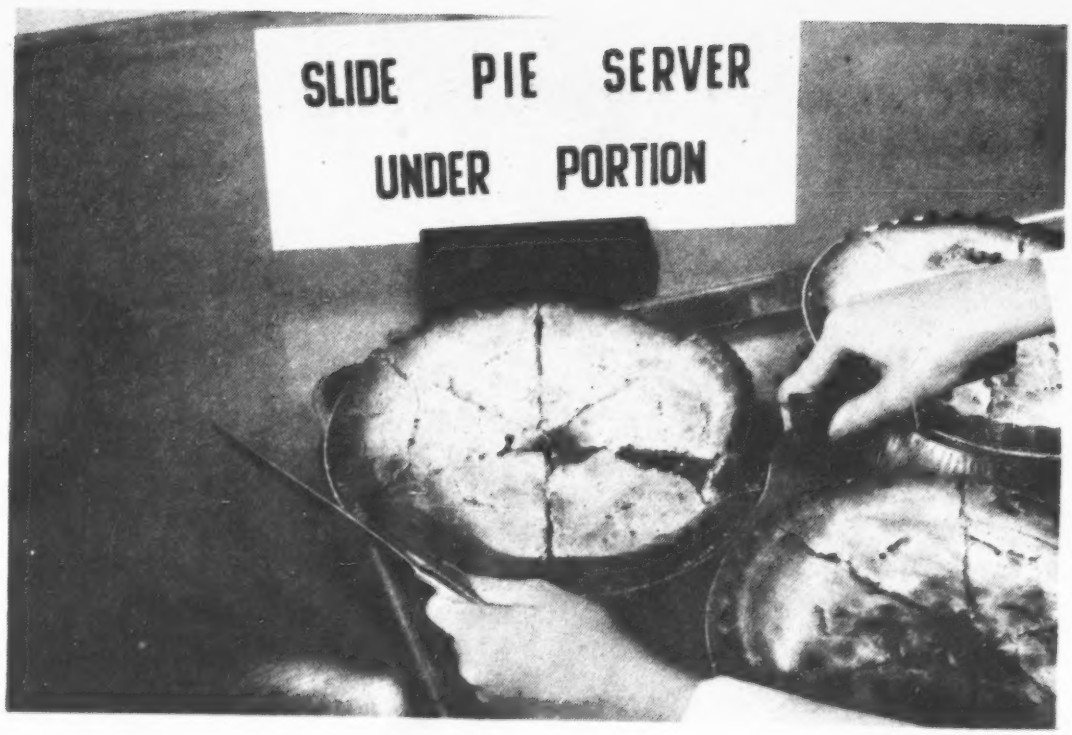


Mark all pies to be cut. This avoids extra effort of picking up and laying down the marker.

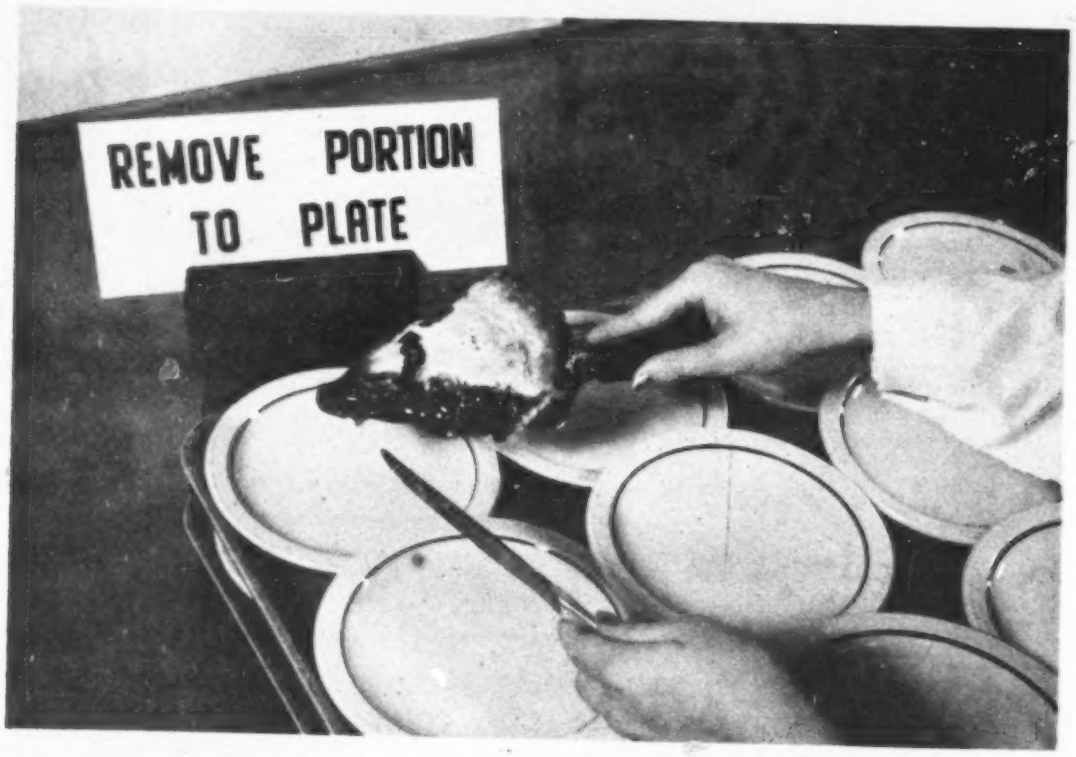
For maximum control of knife, grasp with index finger pointing along top of blade.

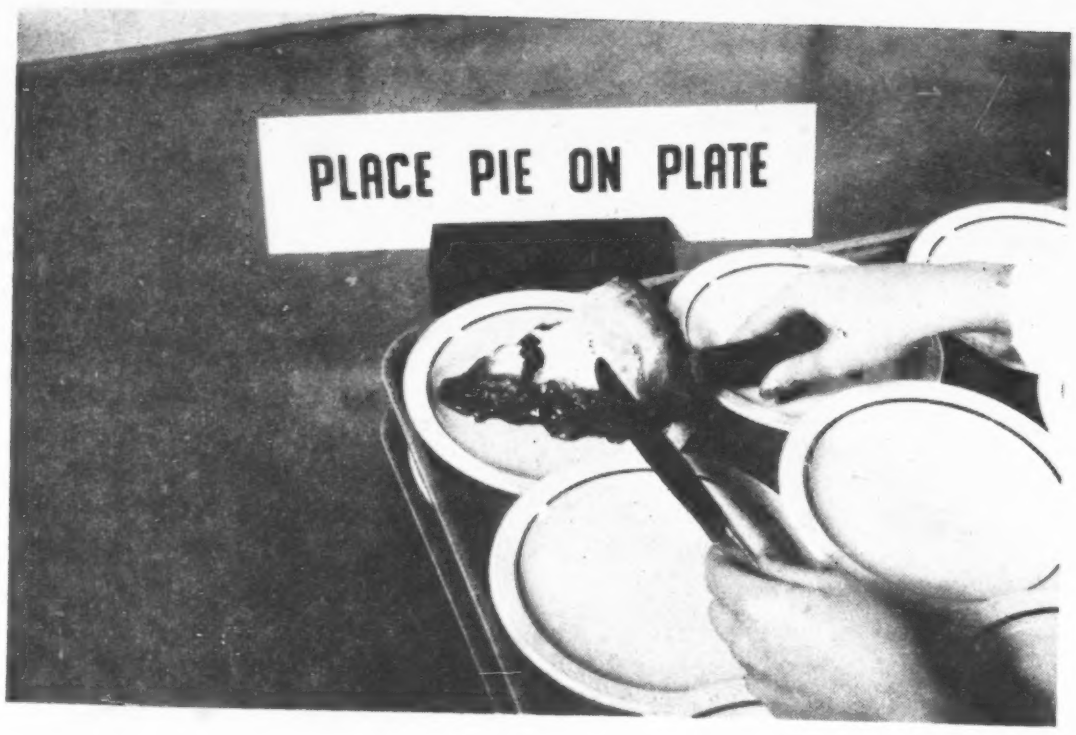


For least work, cut all pies you need at the same time.



Palm knife in left hand.





Center portion on plate.

Use knife to keep pie in position on plate while removing server.

Continue to remove pieces.

APPENDIX G

Dr. S. A. Konz, Associate Professor — Co-principal investigator
Dept. of Industrial Engineering

(see attached resume)

Mrs. R. Middleton, Instructor — Co-principal investigator
Dept. of Institutional Management

(see attached resume)

Consultants:

Helen Scheve, State Supervisor, Home Economics Education, Kansas State Board for Vocational Education.

Dr. Elen Champeaux, Assistant Professor of Education, Kansas State University.

Patricia Beezley Norris, Owner of the Pennant Cafeteria, Topeka, Kansas; Member, Education Committee and member, Board of Directors, National Restaurant Association.

Grace M. Shugart, Professor and Head, Department of Institutional Management, Kansas State University; Chairman, Food Administration Section, American Dietetic Association.

FACULTY RESUME

NAME: Raymona (Hilton) Middleton

TITLE: Assistant Professor of Institutional Management

DEGREES: B.S., University of Nebraska, June, 1937
M.S., Kansas State College, June, 1941

EXPERIENCE: Assistant Food Service Director, Y.W.C.A., 1937-1939
Graduate Assistantship, Kansas State College, 1939-1941
Instructor, Kansas State College, Department of Institutional Management, 1941-1942
Teacher of Home Economics, Iola Junior High School, Iola, Kansas, 1956-1961
Food Production Manager, K-State Union, 1961-1962
Instructor, Kansas State University, Department of Institutional Management, 1962-1965

Present Responsibilities:
Teaching-Assistant Professor, Kansas State University, Department of Institutional Management
- Quantity Food Selection and Preparation
- Food Production Management
- Institutional Equipment

Research-Agricultural Experiment Station
Project Leader:
- Guidelines for Quantity Food Recipe Standardization
- Food Production Procedures Contributing to the Efficient Use of Manpower in Institutional Food Services.

HONORARY AND PROFESSIONAL SOCIETIES:
American Home Economic Association
American Dietetic Association
Phi Upsilon Omicron
Delta Kappa Gamma

PROFESSIONAL PUBLICATIONS:
Slides Plus Recorded Commentary Instruct Food Service Workers. Published Hospitals Magazine, Oct. 16, 1965. (with Stephan A. Konz)
Buffets - Hospitality Hints. Extension Service Bulletin C-362 Feb. 1966. (with Elsie Miller)
Work Instruction Program - Salad Assembly. Accepted for publication in Hospitals Magazine. (with Stephan A. Konz)

FACULTY RESUME

NAME: Stephan A. Konz YEAR BORN: 1933

TITLE: Associate Professor of Industrial Engineering

DEGREES:
B.S., University of Michigan, June, 1956
M.S., State University of Iowa, August, 1960
M.B.A., Univeristy of Michigan, June, 1956
Ph.D., Mechanical and Industrial Engineering, University of Illinois, June, 1964

EXPERIENCE:
Industrial Engineer, Westinghouse Electric Corp., 1956-57
Industrial Engineer, Collins Radio Co., Cedar Rapids, Iowa, 1958-60
Instructor, Department of Mechanical and Industrial Engineering, University of Illinois, Sept. 1960 - June, 1964
Human Factors Engineer, Lockheed Missiles and Space Division, summer 1962 and 1963
Assistant Professor, Department of Industrial Engineering, Kansas State University, August, 1964
NSF Institute on Reliability, Tuscon, Arizona, summer 1965
Associate Professor, Department of Industrial Engineering, Kansas State University, September, 1965-present

HONORARY AND PROFESSIONAL SOCIETIES:
American Institute of Industrial Engineers
Human Factors Society
American Society for Quality Control
American Society of Tool and Manufacturing Engineers
Institute of Electrical and Electronic Engineers
Sigma Xi

FIELDS OF RESEARCH COMPETENCE:
Human Factors Engineering
Quality Control

PROFESSIONAL PUBLICATIONS:
Review of "Shaping and Controlling Human Behavior in Man-Machine Systems," The Institution for Mechanical Engineers, London, 1963, Vol. 177, #34
Reducing Errors by Patchboard Design, Lockheed Missile and Space Division Technical Report, 1963 (with R. Lincoln)
The Effect of Switch Configuration on the Operation of a Switch Matrix. Lockheed Missile and Space Division Technical Report, Feb. 1964 (with R. Lincoln)
Reducing Errors by Patchboard Design. Human Factors, April, 1964 (with R. Lincoln)
Effect of Background Music on Productivity of Four Tasks. Ph.D. Dissertation, University of Illinois, June, 1964
Programmed Computer Picks Machine Location. Tool and Manufacturing Engineer, Feb., 1965
A Practical Approach to 'Make-Buy' Decisions. Machine and Tool Blue Book, April, 1965

Selecting Speed and Feed Under Factory Conditions. Tool and Manufacturing Engineer, July, 1965

Slides Plus Recorded Commentary Instruct Food Service Workers. Hospitals, Oct. 16, 1965 (with R. Middleton)

Communication of Work Methods. Special Report 58, Engineering Experiment Station, Kansas State University, Oct. 1965 (with G. Dickey, R. Daniels and C. McCutchan)

The Effect of Social Pressure on Decision Making. Journal of Industrial Engineering, Nov. - Dec. 1965 (with S. Redding)

Manufacturing Assembly Instructions. Journal of Industrial Engineering, April 1966 (with G. Dickey, R. Daniels, and C. McCutchan)

Design of Controls Using Force as a Criterion. Human Factors, April, 1966 (with R. Day)

The Effect of Switch Configuration on the Operation of a Switch Matrix. Journal of Applied Psychology, Vol. 50, Oct. 1966 (with R. Lincoln)

Communication of Work Methods. American Society of Tool and Manufacturing Engineers, Technical Report MM66-589, Detroit, Michigan, November, 1966

Manufacturing Assembly Instructions II. Combinations and Forms of Media, Journal of Industrial Engineering, January, 1967 (with G. Dickey)

Controls for Automotive Brakes, Highway Research Board Research Record Series, in press (with J. Daccarett and B. Koe)

Presentation and Dissemination of Teaching Information. Proceedings of 18th Convention of American Institute of Industrial Engineers, Toronto, 1967 (with G. L. Dickey)

Design of Workstations. Journal of Industrial Engineering, in press

Instructions a Donner Pour les Taches D'assemblage, L'Etude du Travail, No. 182, p. 39-54, Mars, 1967 (with G. L. Dickey, R. Daniels and C. McCutchan)

APPENDIX H

FACILITIES

Kansas State University

Human Engineering Laboratory of Industrial Engineering Department

Hughes Model 202 Videosonic

Kodak Carousel slide projector with close-up lens

Rear projection screen

Kodak programmer

Tannenburg tape recorder

Assorted tapes, reels, slide magazines, etc.

Assorted stop watches, timers, etc.

Institutional Management Quantity Food Preparation Laboratory

Complete laboratory of quantity food service equipment, including:

Institutional ovens (Microwave
(Air convection
(Rotary
(Conventional gas and electric

Mixers, bench and floor models

Steam jacketed kettles

Steamers

Grills

Griddles

Fryers

Vegetable slicers and cutters

Hughes Model 202 Videosonic

Kodak Carousel slide projector

Kodak programmer

Revere stereo tape recorder

Photographic Department

Well-equipped facilities, with 3 full time photographers

Computing Facilities

IBM 1410 available if required

Food Service Facilities

Kansas State Union (1000 meals per day)

Six University residence halls (9000 meals per day)

A few of the food service facilities which have cooperated on the project:

Manhattan school lunch program

Pennant Cafeteria, Topeka, Kansas

Memorial Hospital, Manhattan, Kansas

Scheu's Cafe, Manhattan, Kansas

Myron Green Cafeterias, Topeka, Kansas and Kansas City, Missouri

OE 6000 (REV. 9-66)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION

ERIC REPORT RESUME

48

(OP)

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		4-22-67		

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001

TITLE

100 WORK INSTRUCTION PROGRAMS FOR THE
101 FOOD SERVICE INDUSTRY
102
103 FINAL REPORT

PERSONAL AUTHOR(S)

200 KONZ, and MIDDLETON, RAYMONA

INSTITUTION (SOURCE)

300 KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS 66502 Dept. of Institutional Management — SOURCE CODE

310 REPORT/SERIES NO.

OTHER SOURCE — SOURCE CODE

320

330 OTHER REPORT NO.

OTHER SOURCE — SOURCE CODE

340

350 OTHER REPORT NO.

400 PUB'L. DATE 4-22-67 | CONTRACT/GRANT NUMBER OEG 3-6-062159-0608

PAGINATION, ETC.

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RETRIEVAL TERMS

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IDENTIFIERS

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ABSTRACT

800 Training problems in the food service industry are severe--especially
801 for those with low levels of verbal and reading skills.
802
803 A project was started to develop efficient work methods for 100 common
804 tasks in the food service industry and then to prepare programmed learning
805 "packages" for each of these tasks so that underpriviledged employees
806 and potential employees could be trained to hold useful jobs.
807
808 The concept was demonstrated to be good--the unskilled can be
809 trained to do usefull work. Unfortunately the program was cancelled
810 because of lack of Office of Education funds after only ten programs
811 were completed. They are:
812
813
814 Dipped Salad Assembly — Breading Foods for Deep Fat Frying
815 Cleaning a Meat Slicer — Frosting a Cake
816 Making Salad Sandwiches — Cutting a Cake
817 Making Sliced Meat Sandwiches — Portioning Pudding
818 Making Change — Cutting a Pie
819
820 Each program is available for $7 from Department of Institutional
821 Management, Kansas State University, Manhattan, Kansas.
822